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FEBRUARY, 1914

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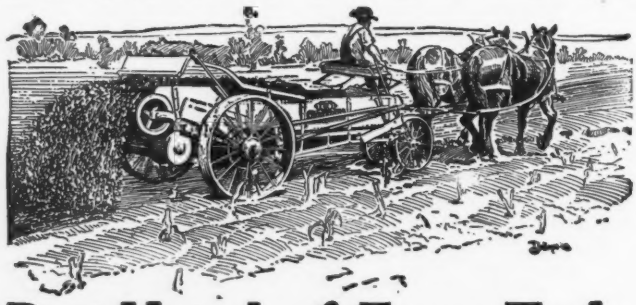

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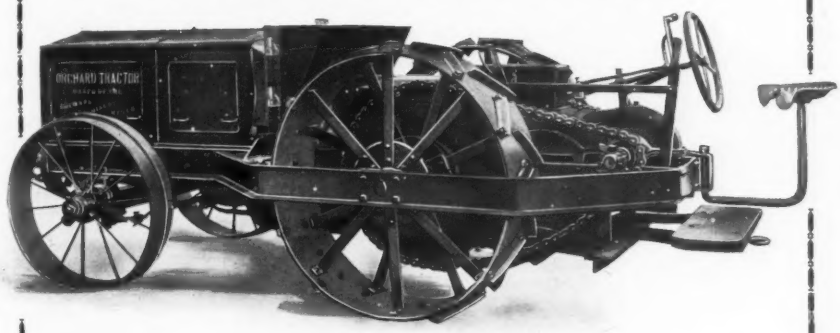

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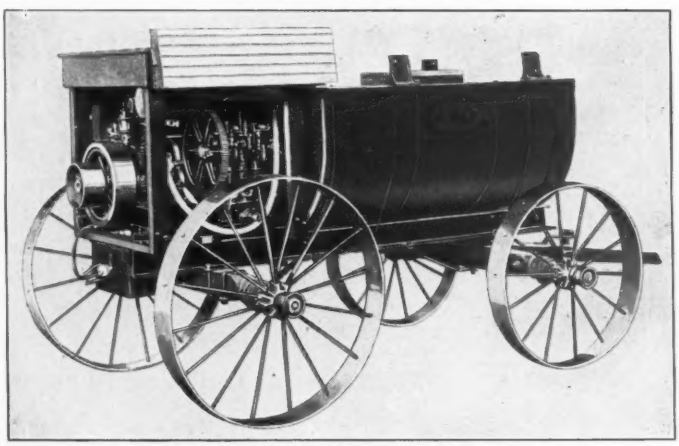

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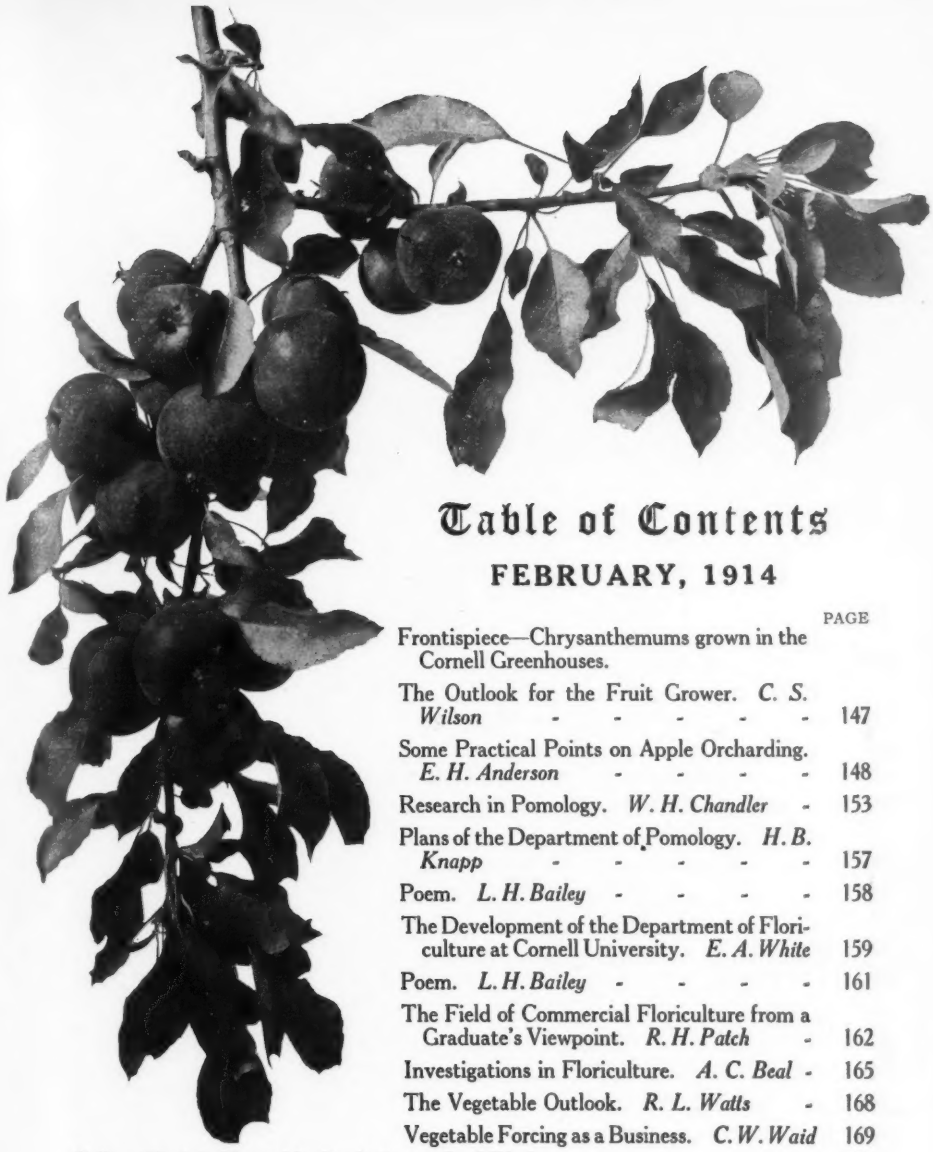

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CHRYSANTHEMUMS GROWN IN THE CORNELL GREENHOUSES.

The Cornell Countryman

Vol. 11 FEBRUARY, 1914 No. 5

THE OUTLOOK FOR THE FRUIT GROWER

By C. S. Wilson

Professor of Pomology, Cornell University

THE outlook for the fruit-grower is brighter today than ever before. Much has been said about the extensive plantings of fruit trees, and some fear has been expressed as to their influence on the price of fruit; however, a careful examination of the facts shows that this fear has been overemphasized and that the new plantings have but little more than replaced the trees that have died.

The United States census for 1910 records the number of fruit trees at that time. A comparison of these figures with similar records from the census of 1900 shows an increase in the number of trees for the last decade. These figures follow:

ALL TREE FRUITS

	Number of trees 1900	Number of trees 1910
United States	369,379,961	432,090,629
New York	21,470,832	24,988,707

THE APPLE

	Number of trees 1900	Number of trees 1910
United States	201,794,764	217,114,688
New York	15,054,832	14,076,718

In connection with this increase in the number of apple trees planted in the United States during the last ten years, it is interesting to observe the change in the wholesale price for this fruit. A detailed study of the price of apples on the New York market for the past twenty years has been made by Professor H. B. Knapp, who found that the average price per barrel for all varieties for the ten-year period from 1890 to 1900 was $2.67, and for the ten-year period from 1900 to 1910 was $2.87. The increase in price during the last ten years over the previous ten-years period is seven and one-half per cent. Similar comparisons for the different varieties give variable figures—in most cases a marked increase, but in a few cases a small decrease. The percentage increase for a few common varieties is:

Alexander	32.3
Fall Pippin	26.8
Fameuse	8.0
Gravenstein	24.3
Maiden Blush	29.1
Oldenburg	24.7
Twenty Ounce	28.3
Baldwin	10.7
Ben Davis	6.7
Northern Spy	22.6
Rhode Island	9.1
Russet	3.3
Esopus Spitzenburg	2.7
Tompkins King	12.0

Fruit farms that are well cared for are producing excellent returns. There is no reason to believe that this will not be true for years to come. It is conservative to say that the better orchards are netting a yearly average from one hundred to two hundred

dollars in New York State, and some of the best orchards are netting even more than this sum. A study of thirty-one such farms by the Department of Farm Management showed an average net profit of about twenty per cent on the money invested.

The practice of diversified farming should receive the serious consideration of the fruit-growers at the present time. This age is called an age of specialization, and it is probable that the idea of "being a specialist" appeals to the farmer as well as to the business man. That there is danger of too great specialization in a single crop has been fairly definitely determined. Failures are common in the case of every crop, and it is reasonable to assume, therefore, that the risk of such failures is lessened more and more as the number of crops planted by the grower increases. Again, on the diversified farm the labor is distributed more evenly throughout the entire year, whereas a single crop requires much labor for a short time. On the other hand, it is true that the farm with the diversified crops does not yield those spectacular returns that are sometimes secured from a single crop for a certain year. Of course the fruit-grower who is raising different fruit crops is practicing diversified farming just as much as though he were growing cereal crops or raising cattle or sheep along with the fruit. The farmer who is planning to specialize in fruit should give careful thought to this question of diversified farming before he plants one kind of fruit too extensively.

SOME PRACTICAL POINTS ON APPLE ORCHARDING

By E. H. Anderson, '08

Farm Agent, Niagara County, N. Y.

TODAY when so much is taught in our colleges and written in our agricultural papers which is in part practical, somewhat scientific and theoretical and mostly "filler," it requires some judgment for the grower to sift the wheat from the chaff and retain only the practical thoughts that are of use.

Since the writer is a grower of fruit and has often resorted to the sifting method and since, as practical orchardists, we are all interested in the net returns from our orchards, this article has been prepared with a view to touching only some simple and practical points.

Most of the readers of this article are interested more vitally in the handling of bearing orchards than in the growing of young orchards, for it is making the best use of old orchards that often makes it possible for the man of limited means to grow young orchards, ideal in his own mind. I say "ideal in his own mind" because the more I see of orchards and orcharding, the more I am convinced that there is no single *Right Way* in which a tree should be trained. Whether it shall be high or low headed, conical or vase-shaped is largely a matter of choice of the grower. However, at present many standard apple trees are being started lower than good judgment seems to justify. What is of prime importance is the type of soil and drainage, the varieties and the care the orchard receives.

Since soil is a fixed factor in all of our bearing orchards and depends upon the wisdom of our fathers or grandfathers in selecting an orchard site, we can pass over this subject for a type of soil cannot be changed save by adding or subtracting fertilizing elements

Fig. 1—IT PAYS TO GIVE TREES PLENTY OF ROOM

and thus improving or destroying its congeniality for tree growth.

The important point for the young fruit grower is to accept conditions as he finds them in the orchard and know how to improve these conditions so that he may make the best out of the bearing orchard on the farm.

Orchard drainage is the first point to consider for no one has yet succeeded in growing orchards successfully on land that is poorly drained. Tile drains are no doubt the ideal solution of this problem, but for most young men starting farming the cost makes it prohibitive on the start and very good results can be secured where surface ditches are properly used. By surface ditches I mean ditches that will remove the water. They may be eight inches deep or they may be three feet deep. But they must be deep enough to give the orchard good drainage, for no fruit trees do well with wet feet.

Some of the best peach orchards in western New York are grown on level clay loam with naturally poor drainage. These orchards depend upon artificial ditches three to four feet deep and six to eight feet wide for drainage. Such ditches are no doubt inconvenient but so is a small bank account. The practical farmer must put up with many inconveniences. It is his ability to do this that has made him the backbone of our nation. The open ditch makes it possible to grow orchards on land that would otherwise be used only for crop rotation.

Aside from the beneficial effects on the tree growth, good drainage makes it possible to spray the trees in season. This may be, therefore, one of the strongest factors in controlling insect pests and fungous diseases. It is considered extremely poor management to have a spray rig in the repair shop when it should be used in the orchard, but this is not as unfortunate a condition as to have it standing in the barn waiting for the water to soak out of the wet places in the orchard.

Pruning and thinning should next be considered. By pruning, I mean the removal of all dead and diseased limbs and branches, all cross limbs and all superfluous branches. All cuts should be made close to the main branch or limb in order that the wound may heal readily. Pruning does not generally mean the removing of large limbs except as stated above, but should

consist more of the thinning of the branches on the outer edge of the limbs. This is a slow process and can be done satisfactorily only by going around the outside of the tree with a ladder, much the same as in picking the fruit.

By thinning, I mean the removal of trees that are crowding—the old system of setting trees crowded too many on an acre. Standard trees, like Baldwins, at 30 feet apart will begin to crowd at 25 years. They should then be thinned by removing every other tree if the orchard is to be thoroughly productive. It requires a strong purpose to cut down trees that are just coming into their prime but for the future good of the orchard this is the only safe way. If the orchard has already suffered by crowding, the remedy is the same—thinning them out on the ground.

In this connection, I wish to call attention to Fig. 1 which shows a 35 year old Baldwin apple orchard on the writer's farm. These trees set 33 x 33 feet began to interlock at 25 years of age and every other row was removed on the diagonal until today nearly one-half of the trees have been removed. This meant the removal of trees fully as good as any that remain and was a strenuous method but final results have proven its value, for under this treatment and the present system of management the yield has gradually increased from an average of 70 barrels per acre in 1908–9 to over a hundred barrels per acre for 1912–13.

Fig. 2 shows one of the Baldwin trees in the writer's orchard. This is, in his opinion, nearly an ideal tree for the variety, and while smaller than many of its neighbors, has produced as high as 20 barrels of marketable fruit per season. Some may claim that this tree needs pruning but with plenty of space about the tree for the circulation of air and sunshine and for spraying, considerably less pruning is necessary. Results are what the commercial orchardist is after and wherever we can save in pruning or any other orchard operation without sacrificing the quality or quantity of our fruit, it is to our advantage to do so.

Spraying of the orchard is next of importance. This is a subject about which so much is said and written that there is little need of dwelling long on the matter here. Spraying must be looked upon as a matter of insurance. No doubt much spray is applied that is unnecessary but since we are unable to foretell conditions, we must continue to spray and spray thoroughly. Here, I believe, is where many otherwise good apple growers fail; they do not spray because they do not see anything to spray for and when it can be seen, it is too late to prevent the damage. Others do not seem to realize that scale insects must be hit with the spray to kill them and that the foliage and the fruit must be covered with the spray to be protected from the attacks of worms and fungus.

What brand of spray material or poison is used is of little importance so long as it has been tried out; but the way it is applied is of vast importance. The writer has grown just as good apples in an orchard of twelve acres in area with the old hand power pump and bordeaux mixture as he has with the use of a modern spray rig and lime-sulphur. The efficiency of the men, of course, was not as great with the old equipment, but the quality of the fruit was apparently as good.

When lime-sulphur and arsenate of lead are used for the summer sprays, it is often economical to apply more poison than is ordinarily advised; more fruit free from worms will ordinarily result from such an addition. The admonition to "Watch and Spray" has been very aptly given. While the calyx spraying and one applied a month later will ordinarily be sufficient spray on the fruit, the writer believes he saved more than enough to pay his entire season's spray bill this season by spraying the fruit about the last of July. Other seasons he has seen better fruit grown with two sprayings on the fruit applied at the proper time than was grown in

neighboring orchards sprayed five times at random.

The point that I wish to impress is that economical spraying requires judgment, thoroughness and some knowledge of insect pests and fungous diseases, and to be assured of all these points, the grower must generally take charge of the spraying himself, whether it is agreeable to him or not.

be plowed early and cultivated every ten days, or after every rain, until the first of August when a cover crop should be sown, preferably a legume unless the orchard is making extremely rapid growth, a condition which is seldom found in mature orchards.

No other fertilizer seems to produce as good results in the apple orchard

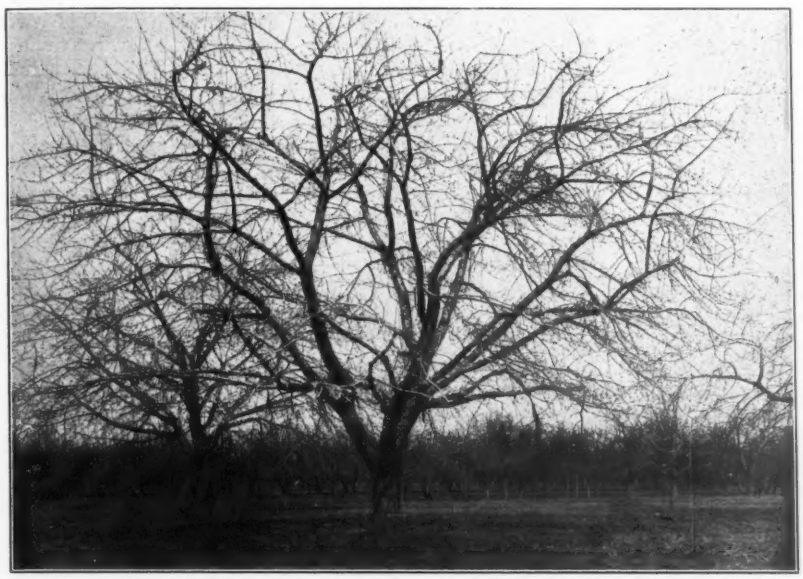


Fig. 2 - IDEAL TYPE FOR THE BALDWIN

Other operations on the farm may, perhaps, safely be left to the judgment of hired help; but where spraying is left to them, it is the exception when satisfactory results are secured.

Orchard fertilization and tillage are both large subjects and can merely be touched on here. With very few exceptions, apple orchards do much better where tilled than where left in sod-mulch or pastured. Plowing an orchard deep that has been long in sod will destroy many roots. The orchard should, therefore, be plowed as shallow as possible, and what few roots are destroyed will not damage the trees as much as the plowing will do them good. The orchard should

as barn-yard manure. If the orchard needs stimulating, the use of 20 wagon loads of manure per acre repeated yearly for two or three years and supplemented with leguminous crops, as clover or hairy vetch, will ordinarily put the trees in such condition that unless the orchard is on extremely light soil or the trees too thick on the ground, the fertility can afterwards be maintained by the leguminous cover crops. When manure is used in an orchard, the trees seem to use it to best advantage when applied in August than when applied earlier or later.

No discussion on orcharding would be complete without touching on

picking and marketing the fruit. One point that has been often noted is the haste that some growers seem to be in to begin harvesting their fruit. It would seem that many growers begin picking their fruit by consulting the calendar instead of examining the maturity of the fruit.

The last week or ten days that an apple can hang on the tree without dropping will often increase its size one-third; while the color that it takes on the last few days is absolutely necessary to produce fancy fruit. This is an important point in the production of fancy red apples, for an apple may be of perfect shape and free from blemish, but if it lacks color, it cannot be classed as fancy.

The writer has sometimes begun picking Baldwins the day that neighbors have finished their apple harvest. This delay was intentional to allow the fruit to mature and take on color, and the resulting sale of the fruit has seemed to justify this method for in six seasons the drop of the apples has not been large enough to counterbalance the gain in growth during this time and the fruit put on the market is well colored instead of having little or no color. It will, of course, require a larger force of help to harvest a crop of fruit in ten days to two weeks time, than it does in three or four weeks time but the resulting quality of the fruit will justify this inconvenience.

The statement is often made that as highly colored fruit can not be grown on cultivated orchards as on sod orchards. This, I believe, is not true. It is, however, true that as highly colored fruit cannot be grown in a cultivated orchard in the same number of days as can be grown in a sod orchard. We cultivate to increase the size of the fruit and the vigor of the tree. The cultivated orchard, therefore, naturally requires more time to mature its fruit and foliage; and when this time is given satisfactory color is developed.

Every grower should establish a grade of packing that he holds to year after year. This grade should not be anything below the "Standard Grade" established by the U. S. Congress. With such a standard a reputation will soon be established and buyers will be willing to pay a premium for apples so graded.

It is just as true that there is a trade that can handle our second grade apples as it is that there is a demand for first grade fruit; but it is obvious that the trade that has a call only for selected fruit cannot handle the two grades in one barrel to advantage and will naturally turn toward packs that can be depended on.

Even when apples are properly graded, the packing often has much to do with the price. Apples must be handled so they show no bruises in the operation of packing. This means picking them from the sorting table instead of rolling them as is sometimes done.

Apples sold on the docks in New York City are usually sold by the face and although apples of the size of Baldwins and R. I. Greenings look better when the face contains two circles of uniform size with the center filled with three or four apples, the trade demands that fancy apples must be faced with two rows and one or two apples in the center. The rest of the barrels being equal, a barrel faced in this manner will often sell for from twenty-five to fifty cents a barrel more than will a barrel with three or four apples to fill up the center.

The practical thing for the grower to do, therefore, is to grade and pack the fruit honestly, and if the trade prefers the face to be of large apples, pack them accordingly. If the fancy barrel trade wishes to be notional as to how apples are served to it, there is little use in arguing. We are all more or less notional.

There is a tendency among young growers to speculate on the market and place their apples in cold storage, expecting the price will advance materially. They should remember that the storing of apples is accompanied with much risk, and while it may be a

good investment for the speculator or the man who has money to invest, it is doubtful whether it is advisable for the man who is dependent upon his apples to pay farm expenses.

When a grower who is unacquainted with the market must depend upon others to sell his fruit, it will at least be a more conservative venture to accept a reasonable price for his fruit in the fall and allow the dealer to run the risk of markets.

RESEARCH IN POMOLOGY

By W. H. Chandler

Professor of Research in Pomology, Cornell University

AT a recent meeting of horticultural workers from various colleges and experiment stations throughout the country, the director of an experiment station stated his opinion that in research work men interested in pomology have not kept pace with those in other lines of agriculture. If I understood him correctly, he explained this by saying that in the rapid dividing-up of the agricultural colleges and experiment stations into new departments the older men with less initiative had been left in the departments of horticulture. As to this last, it is possibly true that there are more of the older men in departments of horticulture than in most of the other departments. But I do not believe it is true that because of this the departments have lagged in research; in fact, I think the best work that has been done in pomology has been done by these older men. The fact that research in pomology has not kept pace with research in some other departments at experiment stations can be explained by the nature of the work.

One of the most important causes of slow progress along this line is the long life of the individual plants with which the pomologist works. The man working with field crops may carry through an experiment with oats or corn in one season. The life of an apple tree may be forty years or more, and some experiments would require this length of time in order that positive conclusions might be reached. Experiments with the culture of a tree certainly require as long a time as is needed for the tree to come into steady bearing after it is planted; and generally a much longer time is required.

When it is considered that an experiment must be verified by being duplicated once, or more than once, before positive conclusions are justifiable, it will be seen that conclusive cultural experiments could hardly be expected during the period since agricultural experiment stations were established in most states. It is further true that in almost any field of research the earlier experiments are of necessity often considered only as opening a way for more thorough experiments. Then, if we allow the length of time required for one experiment—let us say fifteen years—for a sort of survey of the field—expecting that many of the experiments will be rendered inconclusive by mistakes—and as much time in addition for more carefully planned experiments based on the earlier experience, and as much more time for carefully duplicating experiments, some of them perhaps under different conditions, it is more evident that the time element very greatly affects results obtained in pomological research. It is probably true also that there is a much larger quantity of carefully taken experimental data on orchard practice than some of the critics realize, for the reason that this experimental knowledge has not yet been summarized in book form. There

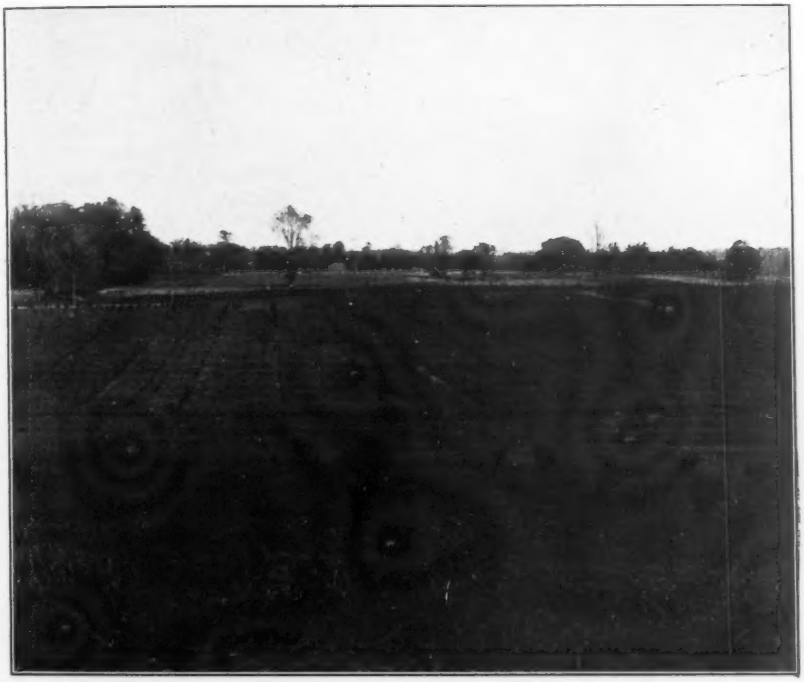
is also a large quantity of experimental data that seem conclusive, but yet requires to be verified by other experiments and other experimenters under different soil and climatic conditions.

Another factor that has played a large part in reducing that amount of research in pomology is the small number of plants on an acre. I think I am safe in saying that in cultural expriments, such as the use of fertilizers or different methods of cultivation, the man working in field crops can draw more positive conclusions from results in experiments with oats, corn, or wheat grown on a half acre of ground than the pomologist can with apple trees grown on ten acres of ground. The field-crop man would certainly have a much larger number of individuals to work with on his half acre. The man working in pomology must have very large plantings in order to be able to secure results that are conclusive; and a very few of the departments in agricultural colleges or experiment stations have had these large plantings available for experimental purposes.

The action of frosts and the limitation of the fruit industry for other reasons have greatly reduced the number of men that could possibly do effective pomological research. It is well known that with but few exceptions the agricultural colleges and experiment stations of the Mississippi Valley began to be liberally supported by their states and to become strong sooner than did those of other sections of the country. Because of the large percentage of crops lost by frost in the section where fruit is grown in the Mississippi Valley, and because of the number of states in which the fruit industry is of little importance, very little far-reaching work has been done in these states except in the line of spraying. In nearly all cases the valuable cultural experiments have been finished by a few states in the East.

The critic mentioned above stated as his opinion that too much of the work has been of a superficial nature, and too little effort had been made to get fundamental results as to the physiology of the tree. This criticism is probably just; and it would probably be a just criticism of almost any other department of agricultural research. The critic was of the opinion that before an experiment, say in orchard heating should be undertaken, long preliminary experiments in order to determine the factors that would influence the problem to be attacked, should be conducted. In case of orchard heating a test should be made of the ability of the trees with different forms of planting to hold the heat during cold nights, the rate of radiation from different types of soils in an orchard, and the like. In my opinion, such preliminary studies would have added very little to the results so far obtained as to the possibilities in orchard heating, and a much easier plan would be to begin some preliminary experiments in actual orchard heating in order to determine the nature of the problem to be attacked. Thus, so far as my knowledge of experimental data obtained in orchard heating goes, the labor and interest cost is greater than the material cost, and with heaters of, say, three gallons capacity, the temperature may be kept above the freezing point in any frost that is likely to come after blooming time. If this be true, the influence of the trees in holding small amounts of heat or of the soil in reduced radiation would have little effect on the results of the experiments conducted. The most important factor to be studied would be methods of reducing labor cost and of determining whether or not during a period of ten or fifteen years in any section, the number of crops saved would offset the cost of actually heating the orchard when a crop is saved, plus the cost of heating when the temperature did not fall low enough to kill, plus the cost of saving crops that would later be lost for some other reasons, plus the interest on the very large investment. Likewise it is very doubtful whether any preliminary physiological studies

preceding experiments with fertilizers would have added as much to the value of the results obtained as the preliminary fertilizer experiments have. Thus, the physiological and chemical knowledge available would have led us to the conclusion that potassium is a peculiarly important element of fertility for an apple orchard, and that nitrogen is applied with considerable danger that it may increase the vegetative growth of the tree sufficiently to reduce its fruitfulness. Actual experimental data has shown rather conclusively that potassium is one of the least important elements of fertility that it may be necessary to apply in an apple orchard, and that nitrogen, where it has shown any effect at all, has nearly always increased the fruitfulness of the trees.



A NEWLY PLANTED EXPERIMENTAL ORCHARD AT CORNELL

I do not wish to leave the impression that I consider knowledge as complete as possible of the physiology of the tree of little importance in conducting cultural experiments. Not only should any man conducting experiments with trees be acquainted with the best methods of research in order to intelligently plan an experiment, but also he should be acquainted with all the experiments that have been done concerning the physiology of the tree in order that he may know the influences that may affect his results. However, it will be a long time before we have sufficient knowledge of the physiology of the tree so that we may predict the results that would be obtained from experiments with any kind of orchard practice. Thus, we have been giving advice as to pruning and other treatment for the roots of trees in transplanting; yet the Wobern Experiment Station seems to find that the only important

precautions in transplanting a tree are to set it at about the proper depth and to make the soil very firm about the roots. It is therefore necessary that all phases of orchard culture should be carefully tested by experiments conducted over a large number of years. In addition to this, the experimenter in pomology should be able to conduct fundamental experiments in order to determine more fully the nature of the plant with which he works.

Not only must the experimenter in pomology be acquainted with the experiments in plant physiology, and in other subjects in which results are likely to give information as to influences that may have a bearing on the response of the trees to various cultural methods, but also he must have a rather thorough knowledge of the nature of the fruit business so that he may know what results have practical bearing and what have not, and so that he may be able to apply the experimental results to actual practice. Thus, it is not sufficient that he determine that, in certain sections of the country, by whitewashing peach trees in winter the heat is reflected instead of being absorbed, and the buds may be kept dormant later in the spring. He should go further, and make careful tests in order to determine whether or not such a method would give profitable results, when the expense of doing the whitewashing is compared with the amount of fruit saved during a long period of years. It is not sufficient to determine that, in some sections, by increasing the vigor of a peach tree its rest period is prolonged, and therefore the buds are not so likely to be pushed into growth during warm periods in winter. It is necessary to determine also whether or not the disadvantage of such increased vigor, or the cost of producing the increased vigor, are more than equalled by the benefits derived.

However, the fact that immediate results of financial value to present growers may not be derived from an experiment that is likely to add to our fundamental knowledge of the nature of a fruit tree should not prevent the experimenter from conducting such an experiment. Anything learned of the nature of the tree may be of value in connection with other experiments, or in ways not thought of at the time by the experimenters. It is also true that financial conditions may so change that a method of culture which would not be profitable at the present time because of labor cost may come to be profitable through increases in the price of the product.

Thus it will be seen that the field of knowledge required for valuable experiments in pomology is rather wide. The idea of the experimenter should be to gain such complete knowledge of the nature of the tree that it may become possible to give definite information as to results of any cultural method from fundamental knowledge of the tree, associated with knowledge of the financial nature of the fruit business. The field for research in pomology then, it seems to me, should be to conduct any experiments that the experimenter is equipped to conduct pertaining to the subject of fruit trees or fruit-growing except where they can be better conducted by such specialized departments as entomology or pathology. It is evident that there will be much overlapping with other departments. This is highly to be desired, since the stimulus of association and competition with other departments should tend to add to the efficiency of the experimenters in pomology.

PLANS OF THE DEPARTMENT OF POMOLOGY

By H. B. Knapp

Assistant Professor of Pomology, Cornell University.

THE Department of Pomology is still young, having been organized in 1910. Like most new institutions, it can point to few pieces of accomplished work. But as youth means enthusiasm and enthusiasm begets hope, there is no lack of plans for the future. Some of these plans have progressed far enough to permit of their appearance in print, many of them are too hedged about with uncertainty to be more than hopes. Ordinarily and at all other times it is well to neither write nor speak about what we intend to do until we have done it, after which it is unnecessary. Let us proceed to violate this rule.

The organization of the Department of Pomology is similar to that of other departments of the college. It is composed of three divisions, teaching, investigation, and extension. Of these, the first is best developed and systematized, and while constant efforts are being made for its improvement, it is felt that the department is stronger here than elsewhere.

No real experimental and investigational work has been undertaken until the present year, owing to lack of funds and facilities. The department (at that time a part of the Department of Horticulture) was a heavy loser when the University in its development eastward destroyed the entire field laboratory, including one of the finest collections of fruit species in America. It has taken and must still take time to recover from this setback. At present department plantings embrace about fifty acres, part of which is laid out as a commercial orchard, while the remainder is given over to variety and species plantings. These include 104 varieties of apples, 126 varieties of peaches, apricots, and nectarines, 75 varieties of pears, 57 varieties of cherries, 71 varieties of grapes, 72 varieties of plums, and approximately 35 species. These plantings will be extended and enlarged as rapidly as seems advisable. At present especial attention is being paid to the setting of bush fruits. It is hoped that adequate facilities for investigational work will be afforded by this field laboratory and that orchard practices may soon be demonstrated to the students in a way that has not been possible in the past.

A test of the value of dynamite in the setting of trees has already been instituted, experiments in the fertilization of bush fruits and strawberries will be undertaken in the spring, and plans are now being laid for some long time experiments in the pruning of apple trees in different sections of the state.

The extension division of the department aims to carry the proved results of investigation and practice to the farmers of the state. If one-half of the pomological information that has accumulated in the last decade could be put before farmers in a practical and intelligible manner, a great forward step in fruit-growing would be taken. There is little use of collecting such information if it is to remain forever locked up in college libraries and department offices, though some escapes that ought to remain there. At present this division performs most of its work through the following agencies: extension schools, community demonstrations of pruning and spraying, inspections of orchards, and meetings of granges and other organizations. In addition, a very healthy correspondence is maintained concerning those problems that can be solved without a personal inspection. Whenever possible arrangements are made and carried out through the Farm Bureau agents, who

are more familiar with local conditions and needs than are members of the department staff. Preliminary steps have been taken for the supervision of an attempt to renew a neglected orchard for one of these agents, a test of cover crops is to be made in the Champlain Valley, and a number of similar projects are under way.

It is a part of the plan of organization of the department that members giving their attention to any one of its divisions shall also do some work in the other branches. That is, the members of the teaching staff must do a certain amount of investigational and extension work, the investigators must keep in touch with the students and with the growers, and the extension workers must know how to teach within the college and to do original work. It is felt that this will insure a better all-around development and a fuller measure of efficiency than would be possible if each man were to confine himself within the narrow limits of his special field of work.

It is the hope of the Department of Pomology that through the coöperation of its various branches it may become so familiar with every nook and cranny of the Empire State that real help may be given to those who seek it and that real service in fullest measure may be rendered to all.

"For I planted these orchard trees myself
On hillside slopes that belong to me;
Where visions are wide and winds are free
That all the round year might come to my shelf.

And there on my shelves the white winter through
Pippin and Pearmain, Rambo, and Spy,
Greening and Swaar and Spitzenburghs lie
With memories tense of sun and dew.

They bring the great fields and the fence-rows here,
The ground-bird's nest and the cow-bell's stroke,
The tent-worm's web and the night-fire's smoke,
And smell of the smartweed through all the year.

They bring me the days when the ground was turned,
When the trees were pruned and tilled and sprayed,
When the sprouts were cut and grafts were made,
When fields were cleaned and the brush-wood piles burned."

(From the "Rural School Leaflets")—L. H. BAILEY

THE DEVELOPMENT OF THE DEPARTMENT OF FLORICULTURE AT CORNELL UNIVERSITY

By E. A. White

Professor of Floriculture, Cornell University

IN THE earlier periods of agricultural education, the term horticulture covered a wide range of subjects. In many agricultural colleges the horticulturist was expected to teach botany, forestry, plant breeding, pomology, vegetable gardening, and floriculture—in fact, all subjects which pertained in any way to plant life. Not only was he expected to teach these subjects, but much of his time was required for research and what we have now come to know as extension teaching.

This field was altogether too broad for the ordinary man to master, although certain horticulturists did make a marked success even when handicapped by the requirements of such a broad field of duties. The scope of the work was nevertheless too varied for the best results.

The past decade has witnessed a decided change in all lines of agricultural teaching. What was formerly designated as agriculture in the curricula of land grant colleges has been subdivided into dairy industry, poultry raising, animal industry, and subjects of a like nature, until there is now no course in general agriculture given in many agricultural colleges.

CHRYSANTHEMUM EXHIBITION AND TABLE DECORATIONS ARRANGED BY THE STUDENTS IN FLORICULTURE.

The same trend towards specialization has been noticeable in horticultural subjects, and the old idea of horticulture has been merged in the development of special departments such as landscape gardening, fruit growing, flower growing, forestry, vegetable gardening, and the like. This is an age of specialization, and the administrators of agricultural colleges have come to appreciate the fact that no one individual can teach

satisfactorily a wide range of subjects requiring such intensive application as do those dealing with special phases of plant life.

In the earlier periods of horticultural teaching, major attention was given to fruit culture, some emphasis was laid on landscape gardening and vegetable culture, and but little attention was given to instruction in flower growing. A few agricultural colleges had ranges of glass where some flowering plants were grown, but these were largely plants of botanical interest rather than of commercial importance. About six years ago courses in commercial flower growing were first offered by the Massachusetts Agricultural College and the Illinois Agricultural College. So far as can be learned, these were the first attempts to train men in distinctly commercial aspects of the subject. Since that time, courses in commercial floriculture have been introduced into the curricula of many agricultural colleges. In the majority of instances these are still intimately connected with other branches of horticulture and are being taught by men interested also in other subjects.

At Cornell for many years the full schedule, of what were then known as horticultural subjects, was carried by Dr. Bailey. A separate department of landscape gardening, known as outdoor art, was first announced in 1904. A department in plant breeding was established in 1908. Pomology was given departmental rank in 1911. Last June vegetable gardening and floriculture were established as distinct and separate departments. The Department of Horticulture was then no more.

New York State should have the strongest and best Department of Floriculture of any state in the union. It is the purpose of the present administration to make it such. The state has wide and extensive commercial floricultural interests. It has much wealth, therefore private and park conservatories are abundant. The wholesale and retail disposal of flowers is also of great importance in the state.

Statistics taken from the last census give the valuation of flowers and plants produced annually in New York State as $5,148,949. No other state nearly approaches this figure. The next state in valuation of products is Pennsylvania where the annual output in 1909 was $3,803,418. That the importance of the industry is increasing rapidly is demonstrated by the annual production of flowers and plants given in the census for 1900. This was but $2,867,673.

The commercial importance of this industry demonstrates the fact that a strong course of instruction in growing the principal florists' crops should be given at the State College. That this instruction should cover all phases of the subject is important. While this is an age of specialization, the man with the ability to master one special branch of the subject should have as well a general knowledge covering all branches.

The character of the instruction given must of necessity be carefully worked out. There are few precedents to guide one in mapping out floricultural courses. It is important that sufficient glass-house space be available in order to demonstrate the theories of the class room. Up to the present time, work in the department has been seriously handicapped because of this lack. A strictly up-to-date modern house for growing roses should be available. Funds have already been set aside for this house, and as soon as connections can be made with the central heating plant it will be built. Houses for violets, sweet peas, conservatory plants, and aquatics are badly needed. Plans for these houses are now in progress, and it is hoped that they may soon be available.

The investigational work under glass is of the greatest importance. Through the results of research we get valuable material for the class room. It is expected that the project inaugurated by the florists of the state

to get an appropriation of $75,000 for a range to be devoted to investigational purposes will pass the present legislature.

Lack of laboratory facilities has also badly handicapped the department. The building of a new range and headhouse for the Department of Vegetable Gardening will make available more laboratory space for floricultural teaching.

With sufficient laboratory and glass-house space, the courses given should be of such a nature that a student may get a thorough knowledge of plant culture in all its aspects. Courses in commercial floriculture should teach not only cultural methods for growing all crops, but the best means for the disposal of the products as well. This is of special importance. A man may be a successful grower of flowers, but if he lacks a knowledge of business principles so that he cannot dispose of his products to advantage, he will not meet with financial success.

The retail flower trade is coming to be of more and more importance yearly. It is hoped soon to give a definite course dealing with factors concerning all phases of retail store management. A knowledge of the principles of design work and floral arrangement is of the greatest importance in this connection.

Many graduates of agricultural colleges assume the management of private estates. Many take up park work. Each of these duties calls for a knowledge of conservatory plants. A course in these plants is, therefore, of special importance to men intending to take up landscape work where a knowledge of all forms of plant life is valuable.

Courses in outdoor ornamental plants are also essential not only to men who intend to engage in flower growing as a profession, but to everyone interested in outdoor life. The courses in garden flowers and amateur flower growing are especially valuable for landscape students and also for those specializing in home economics.

As has been shown, floricultural education is still in its infancy. Each year sees an increasing demand for men trained to teach this subject. The call comes mainly for the broadly-trained man—the man with a thorough knowledge of all phases of plant life—and for the man who has considerable practical experience in actual commercial or private glass-house work. Men with this sort of training are difficult to find.

It is believed that there is a promising future for this department in the College of Agriculture. The cordial coöperation already extended to the work by older departments is very gratifying. It is not expected that a strong department can be built up in a short space of time, but it is hoped that the foundation may be sufficiently grounded to insure a grade of work which will result in service not only to students of the University but to the florists of the state as well.

HIVE

The building bees are humming
About the angled comb
And yellow bees are coming
With treasure laden home,
And other bees are going
To orchard and to bloom
To fetch new sweetness flowing
For ev'ry honied room;
Ten thousand blooms are vieing
Wherever they may roam—
In hurst or fallow flying
The journey leadeth home.

—L. H. Bailey

THE FIELD OF COMMERCIAL FLORICULTURE FROM A GRADUATE'S VIEWPOINT

By R. H. Patch
Instructor in Floriculture, Cornell University

THE growth of commercial floriculture during the last thirty years has been rapid. This fact is well illustrated by the houses in which flowers and plants are now grown. They are larger, better heated, much lighter than those of earlier days, and the tendency is to build larger and even better houses than before. It is not uncommon to see houses of sixty feet in width, four or more hundred feet in length with a proportionate height to the ridge. Again, the growth of the various trade papers will illustrate the point. Twenty-five years ago the *Florists' Exchange*, published in New York City, contained only four pages per issue. Today this same paper has from fifty to sixty pages. It is the same with the other trade papers, of which there are several. No doubt the trade papers and greenhouse builders have helped in the growth of the industry, but the fundamental causes have been the enormous strides which our country has made since the Civil War.

Commercial floriculture is one of those industries which follows in the wake of marked prosperity. It has always been located in the older parts of the country around the centers of large population and wealth. Here are found those people who, by their education and wealth, have the necessary time and money as well as an appreciation of these products which are forced from nature by the ingenuity of man.

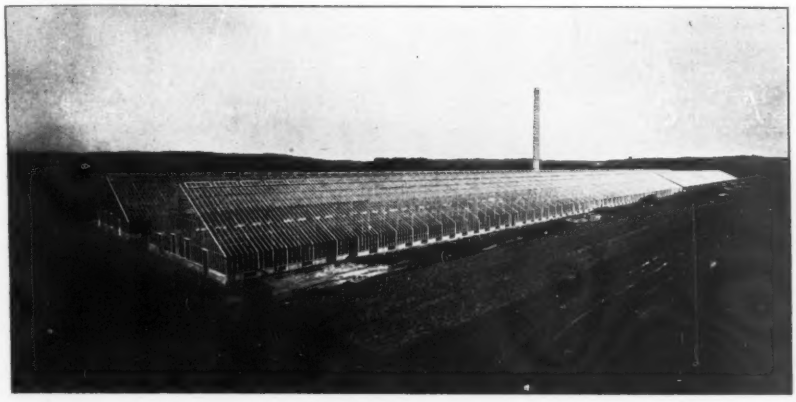
In European countries, where civilization is much older than in the United States, there has for many years been a great interest in general horticulture and especially in floriculture. This interest has centered more largely about private gardens. The more intelligent and wealthier classes have been interested in the improvement of the native flora as well as in the introduction of plants that are likely to prove of value. This has resulted in the training of many men as private gardeners. When the growth in commercial floriculture began in this country, these men trained in the old school began to come here and were engaged on private estates. Little by little they began taking up commercial propositions. These gardeners of the old school are largely responsible for the development of our commercial floriculture as it is at the present time.

We have now reached a point where gardeners of the older types are becoming fewer and fewer, and men born in the United States acquainted with flower conditions here are filling the positions vacated by them. The present period is surely a critical point in floriculture, but herein we find our opportunities.

The subject of education along floricultural lines is new and an open one. There is now great difference of opinion between the older types of floriculturists and the newer as to just how the present-day florists should receive their training. Those of the old school believe in the methods used in the old countries, for the most part apprenticeship. They gave their time for several years to the most common greenhouse operations. Those of the modern school advocate that instruction should be from books, and at the same time practical work is given closely following the theory.

It would be well if the student, before starting his theoretical training could secure a year of experience with some leading grower, or perhaps leave college for a year during his course and spend it in actual practice. He would then know what it was to work a whole year in a greenhouse and follow the different steps in the production of a crop. If it is not possible

or feasible to gather one's experience in this way, he should be careful to secure employment with men of recognized ability during the long summer vacation and so perhaps make up some deficiencies. In but few other occupations does so much depend upon the judgment and intuitive knowledge of the individual as in commerical floriculture. Experience is a valuable asset, and too much cannot be secured before a fellow begins his college studies. Upon this will depend, to a large extent, his remuneration after he finishes college.



A MODERN FLOWER FACTORY.

Very few colleges give courses in commercial floriculture. Among those which do are Cornell University, the Massachusetts Agricultural College and the University of Illinois. Several horticultural societies and floricultural clubs located in the larger cities give courses of lectures throughout the winter season for the advancement of their members, but it is to the agricultural colleges that the trade is now looking for young men qualified in every way to carry on the business already established by the pioneers of the industry. What are the possibilities before a college graduate who has specialized in commercial floriculture?

The first opportunity, and probably the best, presents itself to one who has sufficient capital, and who during his college course or before he entered college has secured the practical experience so necessary to success in conducting a business. The field is open for such a person to engage in commercial floriculture himself, either from the wholesale or retail end, or both—that is, the raising and selling of his own produce. It is possible to construct a greenhouse for seventy-five cents per square foot of ground covered, or even less. There are few other businesses in which a man may engage with so little capital and yet develop to such extent as in commercial floriculture. For three or four thousand dollars a man may start in and within a short time develop a thriving little business if the right location has been secured. If one does not care to build at once, he may perhaps discover a business located in some progressive city which it is possible for him to buy or rent.

Employment may perhaps be obtained in one of the commercial establishments of which there are many here in the East. This would probably best suit those who have no experience or capital. At first the work will be of a simple nature and hard. Little by little advancement will come until the workman becomes

the manager and perhaps the owner of the plant.

The creation of so many private estates has produced a demand for men trained as gardeners and florists. These men need a general knowledge which should include not only that of commercial floriculture, but other subjects closely related and equally important in the management of a private estate, because invariably these men become superintendents either as a whole or in some special line of work.

In the parks, garden cemeteries, and experiment stations there are always desirable places for commercial florists as gardeners. A park of any reputation has a greenhouse in which are housed plants valued for botanical and ornamental uses. A garden cemetery must have a range sufficient for the growing of the many bedding plants that are used each year, and also the ornamental plants that are made use of in the tropical effects so often produced in summer. The majority of our experiment stations have greenhouses usually under the charge of a commercial florist.

A phase of commercial floriculture which in the past has been more neglected than others is the selling of the flowers. We find in all of the large cities men engaged in the commission business. They have stores in the market districts where they dispose of produce shipped to them on commission. On the streets outside the wholesale districts we find retail merchants. These dealers secure supplies of flowers from the commission men. There are opportunities for college-trained men in both wholesale and retail houses. This field should perhaps be given more weight than heretofore because of the fact that the main problems before the commercial men today are of distribution rather than of production. Ten years ago this was not the case; the question of supply troubled the florists. Now it is organization, system, salesmanship, and distribution. Of course there are even now communities that have not yet caught up with the supply, but in numbers they are far in the minority.

Grouped with the disposal of floral products comes the opportunity for the artist who deals with the arrangement of flowers. He may enter the field as a professional decorator, not only making set designs but supervising the make-up of decorations for weddings, banquets and functions of like nature. This field is especially attractive for one who has natural taste along these lines.

Greenhouse construction is another field which has been neglected in the past, partly because of the fact that this sort of work has been in the hands of a few large concerns. Now these companies are beginning to look for college-trained men to manage their various departments.

In college work there is a growing demand for commercial floriculture. The fact that the subject is rather new and has not long been taught makes it evident that there are few men capable of teaching and also of handling the research problems. Perhaps the field is not large because of the few institutions dealing with this subject, but in the course of time other institutions will surely broaden their curricula, dividing horticulture into its branches and introducing commercial floriculture. Investigation has shown that there are only a few men of mature age and experience qualified to take rank as professors in this subject in educational institutions in this country.

Commercial floriculture will not attract large numbers of students as the industry at the present time is based on a luxury. Each year, however, the use of flowers is becoming more and more a necessity. As conditions of living are improved in our industrial centers, people of average means are becoming great users of flowers more from the outdoor viewpoint than from the indoor. However, this tends to put commercial floriculture upon a stronger basis, and is gradually making it a necessity. As an illustration, it might be well to mention the city of Rochester,

N. Y., known as "The Flower City." The city was formerly called "The Flour City," but the name was changed because of the removal of one of the principal industries. Since the change in the popular name of the city, there has been a marked improvement of the individual home grounds, and Rochester is now a model city in this respect.

With the tendency to make flowers a necessity, comes the increasing demand for graduates. This demand is sure to continue because as the country becomes older and richer, a greater interest in floriculture will become apparent. It is to the older countries or sections of a country that we look for information and ideas in regard to floriculture. This is true in regard to the United States, although the West is fast catching up with the East. In the middle-west there are today excellent opportunities in floriculture. The signs of the times point to a promising future for commercial floriculture.

INVESTIGATIONS IN FLORICULTURE

By Dr. A. C. Beal

Professor of Floriculture, Cornell University

SOME of the first investigations in floriculture and greenhouse work in any experiment station were done by the Cornell Department of Horticulture under the administration of Professor Bailey. Among the subjects investigated were electro-horticulture, greenhouse heating, chrysanthemums, asters, dahlias, sweet peas, and annual flowers. In addition to these much excellent work was done by graduate students, and the results are to be found in their theses in the Cornell library. These include studies of the garden evrbena, the genus tulipa, bottom heat, the carnation, the effect of fertilizers on the color of flowers, greenhouse class, etc.

During the administration of Professor Craig the coöperative work between the Department of Horti-

PEONY FIELD.

culture and the American Peony Society, the American Sweet Pea Society and the American Gladiolus Society, was started. The first-named investigation—a monographic study of the species and varieties of the peonies of the world—was virtually completed prior to Professor Craig's death in 1912. A collection of over 1600 supposed varieties was brought together and studied for several seasons. The result was that it was found that there were numerous synonyms of some varieties, and in other cases different varieties were appearing under the same name. When the varieties had been compared and sifted less than 500 distinct varieties were found. Then began the laborious search of the literature and trade catalogues extending over many years as well as voluminous correspondence to determine which name should stand, by the rules of priority, for a given variety. The reports upon this work consist of the Peony Check List and Bulletins 259, 278 and 306.

The investigation with sweet peas was similar in character to the work with peonies. Unlike the work with peonies, however, the sweet pea demands high culture and is influenced more by the season. The work was begun in 1909 and has been carried on in the field and under glass until the end of the past summer. Several hundred varieties have been grown. Some of the results appear in Bulletins 301, 319 and 320, with a final report now in the press.

The gladiolus investigation has been receiving attention for three years, and a large amount of data is available for publication. Over 500 varieties have been tested.

These studies are of the horticultural evolution and improvement, and especially the systematic describing and classification of existing forms and varieties.

SWEET PEA FIELD.

Some of the theses written by graduate students in recent years are Effect of Acetylene Light on Greenhouse Crops, The Effect of Ether in Forcing Plants, The Effect of Ether on Forcing Shrubs, Effect of Temperature on the Growth of Stocks and Antirrhinums, etc.

The above is a brief sketch of the floricultural work of the old Department of Horticulture. Now that a new Department of Floriculture has been organized with a definite research division, it may be asked what it proposes to do.

The investigation division hopes to complete the investigation work already begun with the gladiolus and sweet pea. Last season similar work was begun with asters and climbing

roses. Recently the American Rose Society has entered into an arrangement with the new department for the establishment of one of its rose-test gardens at Cornell. Inasmuch as most of the trade in hardy roses centers in New York State, it is believed that the rose growers will recognize the importance of the tests conducted here and that a large collection will soon be found on our grounds.

Gradually the old department had been gathering a collection of irises, perennial phloxes and some of the other hardy perennials for studies similar to those made with the peonies. These offer material for thorough work and doubtless will receive attention even though there are no national organizations pushing these flowers at this time. Every large genus of garden plants needs systematic study for the purpose of re-classification and definite description. There is, therefore, a large field in this particular line of work which is of broad general interest to all the people of the state.

The new department has sufficient land to enable it to grow all the plants necessary for these studies, to which at the present time it is confined owing to the lack of greenhouses for investigations upon greenhouse crops, although these are of greater interest to the majority of commercial florists.

The florists of the state are behind a movement to secure an appropriation to erect a range of greenhouses for experimental work with greenhouse crops. The lines of work to be carried on then will be determined by existing conditions. In order to ascertain these a greenhouse survey is now being made of the florist establishments on Long Island. As rapidly as possible the survey will be extended to other sections of the State. The problems, however, are many. The fertilizer requirements of all kinds of greenhouse crops should be investigated. Studies should be made on the keeping of cut-flowers grown under known conditions. The effect of anesthetics on shrubs should be more thoroughly studied. Information is being sought by many persons as to the effect of artificial light, electric currents, cold storage requirements, the effect of various chemical reagents on the keeping of flowers, and the effect of various fumigating agents upon plants. The treatment and handling of soil is an important problem.

In conclusion it may be said that floriculture offers one of the broadest fields for investigation to be found within the domain of agriculture. It is practically unexplored, and it is the aim of the investigation division to attack the problems as rapidly and as thoroughly as time and facilities permit. The old Department of Horticulture set a high standard, but the new department must serve even more efficiently the amateur and professional florists of the state. Through the coöperation of all interested in flowers throughout the state, there can be no question as to the service which all the workers in the department can render the cause of floriculture in New York.

THE VEGETABLE OUTLOOK

By R. L. Watts

Dean of Pennsylvania State College of Agriculture

A LARGE number of college men are interested in vegetable gardening. The possibilities of the business appeal to them. They hear enough about the results of this, the most intensive of all types of farming, to cause them to wonder about its future. Will prices continue as satisfactory as in recent years? What is the outlook?

The Agricultural College is the most important factor in American agriculture. It has finally awakened to the fact that vegetable gardening is a great and growing industry, although only a few have grasped the idea that it is far greater in commercial importance than the fruit industry. The last census report fully supports this statement. The colleges will ultimately be of tremendous value to the vegetable growers. Hundreds of their students will become scientific producers. The results of their experiments will be conveyed to the remotest gardener in the most remote district. The colleges will make production more certain and yields more uniform.

Permanent decline in prices cannot occur, for land areas must remain constant; increasing city population will cause increased consumption. Meat prices are abnormally high, and as the shortage in meat is world wide this will necessarily cause an increased consumption of vegetables.

Improved transportation facilities will benefit vegetable growers as much, if not more, than any other class of soil tillers. Good roads will enable them to make deliveries more promptly and at less expense and the products will reach the market in more salable condition. The auto truck will play an important part in the vegetable industry of the future. Improved refrigeration, a practical parcel post, and lower express and freight rates will also benefit the vegetable growers.

Co-operative rural business organizations and city marketing bureaus will stimulate the vegetable industry. Producers will be brought nearer to consumers. There will be fewer middle men and the cost of distribution will be reduced.

Greenhouses will play a more important part in the vegetable industry of the future. They will help to give employment the year round and provide the best facilities for starting early plants.

While the producers of many farm products may fear foreign competition, the vegetable grower need have no fear about this matter. Most of his crops are extremely perishable and must be grown within the borders of our own country.

The greatest opportunity is for college trained men who will acquire practical experience before engaging in the industry on a large commercial scale. Profits depend upon the persistent application of the principles underlying the economic production and disposition of crops under conditions which must be at least favorable to production as well as marketing.

It should be the aim in any farm family, on a good farm, to have a fresh vegetable every day in the year,—from the time radishes and lettuce come in the spring till the last potatoes, beets, cabbages and parsnips are used from the cellar. It is odd that the city family is likely to have a better range of vegetables than the farm family; and it is curious to see farmers buying the common vegetables when they come to town and carrying them out into the open country. I think that every farm family this year should have not less than ten kinds of vegetables growing in its garden, aside from potatoes.

It is apparent that the garden has been disregarded in the farm scheme.

—L. H. BAILEY in "York State Rural Problems."

VEGETABLE FORCING AS A BUSINESS

By C. W. Waid

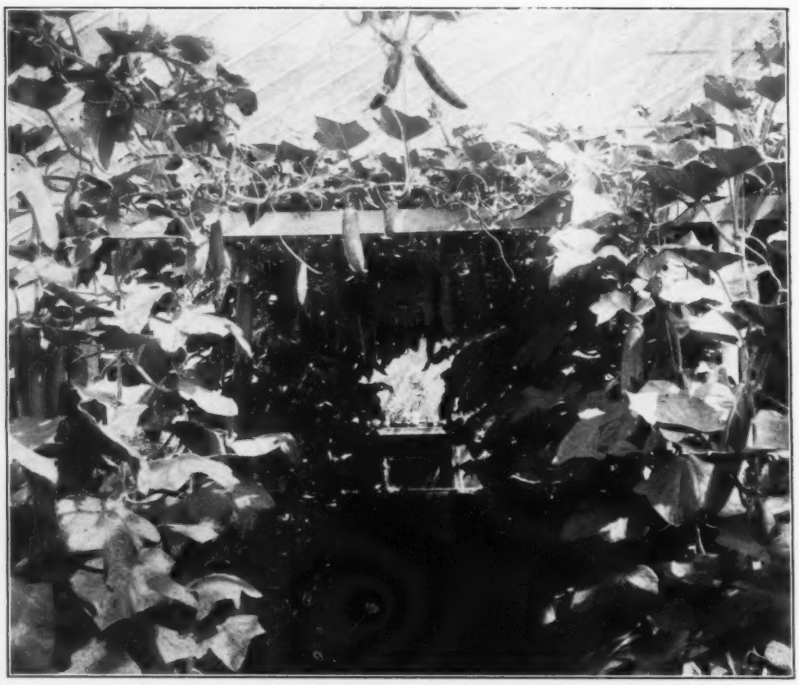
Past-President of the Vegetable Growers' Association of America

VEGETABLE forcing is one of the most decidedly specialized lines of vegetable growing. The man who takes up this line of work as a business should be well equipped for it. One of the first things for him to do is to make a study of himself. If he has a liking for greenhouse work, can apply himself diligently, is not afraid of work or dirt and has an eye for small things he can feel that he has a good foundation upon which to build. If in addition to this he has ability to sell produce to advantage so much the better.

It is not wise to engage in the forcing business on a large scale without having had considerable experience in this line of work. This is one thing which cannot be *learned* from books nor in the class room although they are a help. To gain this experience a person may secure employment with someone else or start in the business on a small scale. If a person has the capital available to build on a fairly large scale it will be better for him to get his experience by working for another grower who has a large forcing-house rather than build a small one of his own. This is assuming that he can get away from home for a year or so. One year's experience if accompanied with an earnestness of purpose will do very well as a starter, but two years would be better.

FINANCIAL RETURN

The money there is in a business is always of vital concern to those who contemplate engaging in it. The financial return from the forcing house business depends very largely upon the location as to market and the ability of the man in charge. Assuming that the location is good and the man at least of average ability as a grower and seller the following figures will give some idea of the financial possibilities in this line of work. It is customary with growers in this section of country in which the writer is located to grow three crops of lettuce followed by one of tomatoes or cucumbers each season. With average success the three crops of lettuce should yield at least two pounds per square foot of bed space for the season. At ten cents per pound the lettuce would give a gross return of 20 cents per square foot. A good crop of tomatoes should give a yield of two pounds per square foot and at 10 cents per pound on an average they too would give a return of 20 cents per square foot. The return from cucumbers is more variable as a rule than that from tomatoes or lettuce but with a good crop and fair prices it should be equal to the return from tomatoes. It will be seen from these figures that 40 cents per square foot of bed space may be secured from one season's crops. The net return will depend largely on the size of the houses, location as to market and cost of labor. If the houses are very small the net return will be proportionately small. There are certain labor items which are practically the same for small and moderately large houses. The net return will be much greater when the grower can sell at a city market or even to grocerymen than when he must sell through commission men. If the grower can do much of his own work and is not otherwise occupied during the winter he can make his net return seem large or small according to the labor item he charges against the account. Some of the large growers in Ohio who keep careful records of all financial operations including the labor items claim that their net return is about 50 per cent of the gross return. A prospective grower should take into account, before he figures out his profits the fact that crop failures sometimes occur and prices are uncertain quantities.



"CUKES" UNDER GLASS

COST OF CONSTRUCTION

The cost of constructing a forcing-house is very heavy. It does not pay to build cheap houses. All-wood houses are not built nearly as much at present as formerly. Semi-iron and all iron houses are the most popular forms of construction. It will cost from $5,000 to $8,000 to cover one-fourth of an acre of ground with glass, depending on the form of construction and the cost of material at the time the building is done. The grower can reduce the cost of construction very materially if he is able and willing to do a good deal of the labor in connection with the building of the houses. This is often done when the houses are small.

LOCATION AS TO MARKET

A person contemplating the building of houses should give careful consideration to the market possibilities. In some places the local markets are well supplied from houses already in operation. There are, however, a number of cities in such states as New York where all of the forcing-house produce sold is shipped in and frequently it is shipped a long distance.

The grower who is located near a good city of 25,000 to 50,000 people which is not already supplied locally has a good chance to sell all the produce he can grow in a good sized forcing-house if he grows good stuff and packs it in good shape. He not only cuts out the express charge, commission and much of the package cost which the man who is obliged to ship must pay but he can get a higher price for his produce as a rule, as it will reach the market in a fresher condition.

OTHER THINGS TO CONSIDER WHEN LOCATING A FORCING-HOUSE

Cost of fuel: It is not only important to know the price at which

coal can be purchased, if it is the fuel that will be used, but the distance which the coal must be hauled should be taken into account. It is expensive to move large quantities of coal a long distance, especially over hilly or poor roads.

Water supply: A large quantity of good water is very important in connection with the operation of a forcing-house. Such a supply should be known to exist before the site for the houses is selected.

Available soil: Any productive soil can be made suitable for forcing-house purposes but it is more difficult and expensive to prepare a clay soil than a sandy soil. A location with a sandy soil on sandy loam is preferable to a clay soil.

Protection: It is an advantage to have the houses protected on the sides from which the prevailing winds come. Trees, hills or building are suitable for this purpose providing they are not too close to the houses.

Forcing houses should not be far from the dwelling as they need constant watching Sundays as well as week days. The closer the location to the shipping point the better not only on account of the coal haul but frequent trips must be made to deliver the produce.

The growing of vegetables under glass is a fascinating occupation for those who like that sort of work. When the location is carefully selected there is no other line of vegetable growing or even fruit growing which offers a greater opportunity to the right sort of men.

COLLEGE WORK IN VEGETABLE GARDENING

By Paul Work

Instructor in Vegetable Gardening, Cornell University

FIFTEEN years ago modern college work in agriculture was in its earliest infancy. Its growth has been marvelous in its rapidity. The foundations were well laid, and the structure which is rising is such that the builders need not be ashamed. It could hardly be expected that all phases of agricultural industry should be developed in due proportion at once. Several important fields have received but scant attention and are only today coming into full recognition.

Among these heretofore neglected fields, vegetable gardening is conspicuous on account of its present commercial importance and because of the opportunities which it offers both in the field and in college and station work. Our urban population increases without abatement. The place of vegetables looms higher each day in the dietary of our people. The products of the home garden, of the market garden, and of the truck farm, whether grown outdoors or under glass, whether sold at once or preserved, are being consumed in rapidly increasing quantities. Hence, we find prosperity and a sane, conservative expansion the order of the day. A realization of these facts, together with the fact that college training is a priceless asset in the field, has resulted in the appearance of many in our institutions who seek instruction and guidance toward a sound knowledge of the business of vegetable production.

The vegetable gardener has been slow to avail himself of the facilities of the colleges and experiment stations. He has enjoyed little special attention from periodicals, from farmers' institutes, and in meetings. He is now beginning to discern the usefulness of these agencies, which have been so helpful in other lines of agriculture, and he requires the services of well trained workers. Under pressure of demands from the growers and from

the students, the colleges are striving to meet the need. They are finding their most serious handicap in the lack of specially trained men. They stand in need of teachers who are able to make intelligent and sympathetic study of the practices of the grower, to focus thereon the light of present day science, and by means of sound class room and laboratory methods are becoming more and more exacting. The college man must offer the best of training in fundamental science, a high grade of work in his technical courses, and a comprehensive field experience, coupled with energy, ability, and a forceful personality. The field manager must show clear cut evidence that he is likely to "produce the goods."

STUDENT CLASSES IN VEGETABLE GARDENING AT CORNELL.

to guide the student toward an adequate grasp of the subject. The colleges and state department of agriculture are seeking extension workers who are equipped to discern the problems of the field and to aid in their solution. Most important of all, the colleges and experiment stations require investigators who are able to broaden and deepen and strengthen the foundation of proven truth upon which the work of the grower and teacher must rest. The writer has within the past few months heard of half a dozen such opportunities, some of which are as yet unfilled.

Let it be understood, however, that seekers of men are unwilling to accept any but the ablest and best qualified. On the other hand, the specifications

The Department of Vegetable Gardening has been organized in the hope that it may in some measure help to meet the demands that have been outlined. It hopes to assist the grower and the student toward a better knowledge of vegetable crops, from both scientific and business viewpoints. A strengthened staff, enlarged equipment, increasing and improving areas in gardens and under glass, and a broadened contact with the men in the field, will all contribute toward the betterment of the courses. Thus may the student enjoy better and better opportunity to gain an intimate acquaintance with the crops and with the business, rather than to gather a mere store of information about them.

READING FOR RURAL COMMUNITIES

By Sarah B. Askew
New Jersey Public Library Commission

[*Continued from the January Number*]

THE fact that many of the subjects sent in were not really subjects but questions which could be answered from an encyclopaedia, led to another line of work. The users of the traveling libraries were invited to send in questions to be looked up and answered. The people avail themselves greatly of this privilege, sometimes calling up over the long-distance telephone to settle a disputed question or get desired information. These questions cover as wide a range as that between "How many eggs will a hen lay in the wild state," to "What is the meaning of the word 'sabotage'."

When a library visitor goes to a town it is part of her duty to choose the right location for a traveling library, as that is a great factor in the success of the work. The post office in the small town, or the general merchandise store, have been found to be the best places, as the libraries there stationed are easy of access to all. The merchants at first had to be persuaded to take them, but when it was found that the library actually brought them business, they were not only willing but anxious to take charge of one. As an illustration, a merchant in a cross-roads store in one state could not be persuaded to take one of these libraries, so the visitor had to be content with placing it with another merchant, about five miles away. After about two months the merchant who had refused wrote saying "Please come out and put me on to a traveling library; that man you gave one is getting all my business."

A quotation from a note will give some idea of the work the libraries in the cross-roads stores are doing: "Please send me some more cook-books and a good, real astronomy. We are having a run on cook-books, and that man you sent the 'Friendly Stars' for says he don't want a baby star book; he wants something like those written by some man he calls Newcum." In a number of instances the traveling library in the store has been supplemented by a permanent local collection bought by the patrons. The merchant has put up a "lean-to" and his wife or daughter take charge of the library for a small sum of money and the companionship the work brings them. This nominal sum is generally paid to the merchant in barter. In one state there are seventeen of these cross-roads libraries.

In some states the traveling libraries are placed in grange halls. Many people are there reached who would otherwise not come in contact with the books. Their actual presence in the grange hall acts as an educational stimulus and has been the means of starting many debates and profitable lines of work. In some of the granges additional reference books have been bought to supplement the small traveling library collection. Sometimes these permanent collections are bought with money raised from produce brought in and exhibited for prizes and then sold at auction. Each farmer brings in his best, and the prices often go extravagantly high. As the local wit is always chosen to auction off the goods, the auction serves two purposes —everyone has a mighty good time and a good deal of money is made. One grange raised as much as $91 in a single evening.

The efficiency of the traveling library service when administered by the grange showed that the greatest good could be accomplished by working in coöperation with other agencies for rural betterment, and so the workers began to study these agencies and to work through and with them. Finding that many of the demands for material were on subjects that could be covered by bulletins from the

United States and State Departments of Agriculture, and that a goodly portion of the questions which came in could be answered best by the agricultural colleges and experiment stations, it became apparent that part of the rural reading and educational problem was to bring the people of the country in closer touch with these institutions. In this way it came about that the traveling libraries are now seeking to coöperate with and make use of these institutions.

The question, "Is the grade of reading better than when you began?" made the worker of whom it was asked stop and think. She saw that while the reading of non-fiction had greatly increased and there were many agencies unconsciously making for a higher literary taste and more reading for power and self-improvement, there was still much room for conscious work in this direction. Many towns that had demanded E. P. Roe ten years ago were still demanding more like E. P. Roe. While many wanted books on soils and house-painting, few in comparison wanted books that taught citizenship, and while many applied books to their business, few applied books to their life. Others awoke to the truth that people must be helped to better reading if the traveling libraries were going to accomplish all that was prophesied for them. As the library visitors came to work for this, the traveling library work took a long leap forward. Whereas, before they had urged that books were needed, now they urge reading with a discriminating and understanding mind, and the desire and ability to translate what is read into life. In working for this they have started reading-courses; inaugurated study-clubs; told stories to the children, and to the grown-people as well; given book-talks; reviewed the books in the different libraries with those in charge of them, to try to help them get the right book to the right person, and are sending out criticisms of books and annotated lists to accompany their libraries.

With these developments the traveling libraries begin really to reach and serve the people, and are no longer a literary patent nostrum sent to a community to kill or cure, but are a living agency for rural betterment. The system might be likened to a telephone system with an interested and sympathetic "central" ready at a moment's notice to put the people in touch with the book needed or the information wanted. These libraries in the States having systems can be found everywhere. You find them in the small log school-house in the pines of New Jersey, in the tumble-down shanty of the North Jersey mountains, in the lumber camps of Wisconsin, in the coal fields of Pennsylvania, in the farm homes of New York State. They are used in the fishing villages, the lighthouse stations, the commuting towns, the Quaker communities, the back-woods, and the thrifty factory settlements.

One of the ultimate purposes of the traveling libraries is to pave the way for the establishment of a local library where such aid in studying and direction in reading can be given to the people as is not possible even with the best administered and most highly developed traveling library system. As a result of the work of the traveling library many of the towns of from five hundred to one thousand inhabitants have good local libraries, and since the township plan for libraries has grown in favor, a large portion of the rural population is being served in this way. To obtain the best results the same requirements should be made of the librarian as of the traveling library visitor—she should be thoroughly in sympathy with rural conditions, should study rural and small-town problems and become acquainted with every agency for rural improvement. If the central library is not within easy reach of portions of the community, branch libraries should be established. This has been done in many instances.

When a town is a trading center for a prosperous rural district, a local

A TRAVELLING LIBRARY STATION IN THE MOUNTAINS OF NEW JERSEY.

public library can be supported adequately and do good work in places of less than one hundred inhabitants. In many districts several small villages have united and established a library at a point accessible to all. In some instances, these libraries have expanded into country neighborhood houses, with rest rooms, game rooms, club rooms and gymnasiums, besides libraries both for adults and children. These coöperative libraries have story hours, exhibitions of books for mothers to inspect for Christmas presents, do high school work, map out programs for study clubs, and carry on as effective work for the allied villages as do the city libraries for their patrons. Some country neighborhood houses have been donated and are supported by endowment; others have been built by the people of the communities uniting.

In one State nine small villages within a radius of ten miles have so united. None of these towns are on the railroad, but they have once a month an eminent minister to preach for them; they have a dancing class taught by a city dancing master; they have basketball clubs and baseball clubs; the woman's club has a fine course of lectures, and they have a good library of twelve hundred volumes, showing a circulation of over eight thousand, and doing good reference work. Not one of these villages has over one hundred inhabitants. In the same State, in a small factory town, the library is over the general mechandise store which is connected with a glass factory, and shows a membership of eight hundred, proving that not only is everyone in town using it but that many of the farmers outside of the borough limits are making use of the books, although the selection is primarily for an entirely different class of people.

In a small fishing village of four hundred inhabitants, the library building is only ten by twelve feet, because of this the librarian says he cannot circulate books to everyone in town, but that he holds out a membership in

the library to the children as a prize for good behavior. He says first hopefully, that his list is constantly growing, and then despondently, that he does not know what he will do for room if the children improve in behavior during the coming year as they have in the past.

The county library plan has been tried with success in many places, the main library being at some central point and the people being reached by means of branches, or, in some instances, by a book wagon, notably in the case of the Washington County Library at Hagerstown, Maryland.

It would seem that with the traveling libraries in their present state of development, the coöperative libraries, and the township and county libraries, the time had come when books are reaching all the people, and the rural reading problem is solved. It may be true that the solution is known, but the problem is not as yet solved. At least a third of the people are still without library facilities because the commissions in charge of the traveling library work are always limited by the amount of money to be had and the time it takes to do the work. Again, many of the people within reach of libraries have not as yet awakened to the need of books. While all of the agencies for rural betterment want to work together, they often, because they do not understand each other, pull apart. The only thing that it seems possible to do is what the old horse who got the heavy load to the top of the steep hill kept saying to himself—"Keep a-going; keep a-pulling; don't stop, for you'll slip back"—and when we see a new line of work that is going to help, take it up; and when we see that someone else can do some of the work we are doing better than we can, give it to them to do.

THE FIRST ANNUAL ENTERTAINMENT OF THE AGRICULTURAL ASSOCIATION

ON WEDNESDAY of Farmer's Week, the students of the College of Agriculture will provide an entertainment, unique in many respects and more pretentious by far than anything hitherto attempted. Judging by present indications, when the curtain rises, not one of the 2500 seats of the new auditorium will be unoccupied and possibly "Standing Room Only" signs will be swinging in the foyer.

In providing this entertainment, the Agricultural Association has been actuated by two motives: first, by this common endeavor the various organizations of the College with their diversified interests will be brought closer together in a spirit of education and service; and secondly, the Association desires funds with which to support and expand student activities. A small admission will be charged and the proceeds divided approximately as follows: 20 per cent to Frigga Fylge, the girls' club, toward their new clubhouse; 20 per cent to the Student Loan Fund; 20 per cent. to the Student Bailey Memorial and the remainder to the Association to be distributed among the various organizations taking part in the entertainment.

As for the entertainment itself, the feature of the evening will be a clever playlet produced by Frigga Fylge, and accompanied by such other attractions as a novel tumbling act, some catchy numbers by the musical clubs and a thrilling drama of western life by the Forestry Club. The senior class promises an amusing bit of rural school life and the junior class a monologue appropriate to the occasion. Every number on the program promises a hit. In fact, the interest in the entertainment shown by every department and club insures an unprecedented success.

FACULTY

PROF. E. A. WHITE.

Professor E. A. White was born in West Townsend, Massachusetts on May 23, 1872. When he was four years of age the family moved to Rindge, New Hampshire, where he was educated in the public schools. He attended high school in Littleton and also in Ashby, Massachusetts. In 1895, he graduated from the Massachusetts Agricultural College with a B.S. degree and was for two years Assistant Horticulturist in charge of the greenhouses of this college. He left there in 1897 to take charge of the greenhouses on the estate of the late Clement A. Griscom, at Haverford, Pa. For two years following he was engaged in commercial work in Arlington, Mass. In 1899 he was appointed instructor in Horticulture at the Baron de Hirsch School, Woodbine, N. J. where he remained for one year. For two years following this he was Assistant Professor of Horticulture at the Texas Agricultural and Mechanical College. In 1900, he was appointed Professor of Botany, Forestry and Landscape Architecture at the Connecticut Agricultural College at Storrs, Conn. He remained here for several years during which time he did some fine work. While at Storrs he published an extensive Report on the Hymeniales of Connecticut. In June, 1907, he was appointed Professor of Floriculture at the Massachusetts Agricultural College.

Professor White began his work at Cornell in September, 1913. He is Professor of Floriculture and head of that department. In the short time that he has been with us he has gained many friends known and unknown to him. His department has been growing and has accomplished some fine things among which are the very beautiful floral decorations which have been provided for our Assemblies and for the Agricultural Banquet. We all are very glad to welcome Professor White to Cornell and wish him the best of success.

CORNELL GREENHOUSES.

The Cornell Countryman

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FEBRUARY, 1914

The COUNTRYMAN announces the election of W. D. Hill and L. C. Schuknecht, both from the class of 1916 to the Editorial Staff. We also thank H. B. MaCartney, 1916, for work done in this competition.

To Farmers' Week Visitors

To the Farmers' Week visitors, the COUNTRYMAN extends a hearty welcome. You will find that the faculty and student body are ready to do anything in their power to make this week pleasant and profitable for you. We want you during the week to realize the work which the college is doing to promote better agriculture and a better rural civilization. The faculty is not working alone in this cause but faculty and students are working together, each with a fine spirit of coöperation. If this spirit existed in every rural community, a large number of our problems could be wiped off the slate.

Students' Association

We would like to urge again that as many former students as possible return during Farmers' Week and that they take part in the program which is to be given on Wednesday of Farmers' Week by the Students' Association. This program is so important that we venture to duplicate it below from the Farmers' Week Program.

10.00 A. M. Address by Acting Director Stocking in Main 392. Following this address a business meeting.

5.30–8. Informal reception and buffet luncheon for former students and faculty members. Head house in the greenhouse range.

Horticultural Number

In keeping with our custom of past years, the COUNTRYMAN devotes this issue to the field of horticulture.

As Cornellians we may feel proud of the splendid work of Cornell men in the advancement of horticulture as a profession. Names like Bailey, Webber, Corbett and Waugh are known the world over, not alone in the assemblies of scientists but in the homes of the practical grower as well. A majority of the prominent horticulturists of this country are graduates or have been connected with this college. Today, our departments of Pomology, Floriculture and Vegetable Gardening are ranked among the best.

It is due in some part to the problems worked out at Cornell, that New York State now leads in the production of fruits, vegetables and flowers adapted to its climate. The industry was never more prosperous. In no locality are finer farm homes or more progressive men and women found

than among the fruit and vegetable growing sections of this State.

Bright as the past has been, the future is still brighter. True, the trials and problems are many but these only serve as advantages to the man who has the training to cope with them.

The opportunities before the college trained horticulturist in scientific work and in commercial production were never greater. The man who makes horticulture his life work will find his reward not on the ledger alone for he who works in orchard or garden assists in the creation of some of the choicest products of nature.

Amendment to the Constitution

At the January assembly, the following amendment was made to the constitution of the Agricultural Association:

Article III. Any student found guilty of violating the Honor System shall not be eligible (1) to hold any office in the Agricultural Association, (2) to be a member of the Executive committee of the Agricultural Association, or to represent the general student body in any college activity within the period of one year.

A College Guide

The Editorial office of the College of Agriculture has published a 160 page book entitled "The Buildings, Land and Activities of the New York State College of Agriculture." It is intended to be a comprehensive guide for the use of students as they go out over the farm and for the use of visitors who are inspecting the College in increasing numbers. The farmers of this state will find it a useful reference book describing the facilities of the college which are at their service. The history, organization, buildings, live stock, topography, soils, cropping systems, investigations in progress by different departments, extension work, publications of the college, the courses of instruction offered and the statistics of the students and their organizations are fully given. The book can be conveniently carried in the pocket. It is available through the mailing room.

The re-direction of any civilization must rest primarily on the people who comprise it, rather than be imposed from persons in other conditions of life. The rural public is now beginning to understand the necessity for a rather radical re-direction of the public school system. This re-direction is to express itself in three practical directions: in better pay for the teacher, in better physical facilities in the way of grounds and buildings and apparatus, and in a course of study that has relation to the lives of the people.—L. H. BAILEY in "York State Rural Problems."

CAMPUS NOTES

Bringing to the January Assembly the message that the future of the meat industry lies with the small farmer and not with the large western rancher, the Honorable James W. Wadsworth, jr., presented the subject in an interesting and forceful manner. During the five years he was speaker of the New York State Assembly, the Agricultural College was at a critical period in its development and it received generous appropriations that have resulted in its successful and rapid ascent to the position it now holds as one of the best agricultural colleges in the country.

Mr. Wadsworth gave statistics showing the amount of meat eaten per capita in the United States and dwelt on the beef-producing industry in Texas and the life of the cow-puncher of today. He said in part: "Statistics show 152 pounds of beef are consumed yearly per capita in the United States which means a consumption of 200 pounds for each adult and places meat next to bread as the staff of life. The "Panhandle" of Texas, Arizona and New Mexico represent the present source of the greater part of the beef supply. In these states the cattle ranches are making their last stand.

"These ranches are from 30 to 60 miles square, entirely fenced in and maintaining a large outfit of men and horses. The life of the cow-puncher is anything but one of ease, as he is in the saddle from dawn until dark, from April till September. The men live practically alone except during the round-up which occupies six weeks. During that time all of the calves are branded and vaccinated for the blackleg and the salable cows and steers shipped away.

"The cattle now bred in the West are pure Hereford with a dash of Durham blood and it is the survival of the fittest since they can live well where an eastern cow would perish. The day of the Texas Longhorn passed years ago and today only a few specimens are found and then only in Mexico.

"With meat consumption at its present high rate, the problem is an enormous one. The dairy farmer of the east can well raise beef as a by-product. It has been seen that the release of the tariff on meat has made no appreciable difference in the price and cannot since the supply is not great enough.

"If steers can be shipped 2000 miles to New York pastures and while there make the land pay, then why cannot the small farmer raise beef? The future of the meat industry, if there is any, rests with him because the large western ranches are decreasing rapidly and forcing it upon the small farmer of the East."

* * *

The College will send to the Sixth National Corn Exposition which is to be held at Dallas, Texas, February 10 to 24th inclusive, exhibits from the Plant Breeding and the Farm Crops Departments and the model for a rural community center. The College will be represented by Professors Montgomery, Mann, and Love and Messrs. Gilkey and Ethridge. Professor Montogmery is a vice-president of the National Corn Association, the organization which manages this Exposition. Professor Love is vice-president for New York State. There has been arranged a very attractive program and some of the most prominent men in the United States in their lines of agriculture will speak. All the large facilities of the Texas State Fair grounds will be at the disposal of the Exposition and the indications are that this will be one of the most interesting and educational gatherings of this kind ever held.

* * *

A. B. Dann, '15, won the first prize of $35 in the speaking contest held before the New York State Fruit-Growers' Association in Convention Hall, Rochester, N. Y. R. C. Parker,

Sp., took the second prize of $15. The subject of the winner was "How Far May Fruit-Growers Specialize and be Safe?" The other men who spoke in the contest were: D. S. Hatch, '15, A. W. Wilson, '15, B. W. Shaper, '14, and R. F. Steve, Sp. A full account of this contest will appear in the March issue of the COUNTRYMAN.

* * *

The tenor of Governor Glynn's message to the Legislature on January 7 was to the effect that this year expenses and appropriations will be cut to the limit. In one of the paragraphs he points out that the increase in expenditures in the agricultural division was $328,092 from 1900 to 1906 and increased $1,063,848 from 1906 to 1912. This is an increase of three times as much in the second six years as in the first six years. However, it is not probable that the appropriations to Cornell will be cut down since the Governor is making his crusade only against unnecessary expenditures. He does not state that the agricultural expenses should be cut down but simply shows that they have increased greatly as well as others.

* * *

The New York State Vegetable Growers Association will meet as guests of the department of Vegetable Gardening during the coming Farmers Week. This organization has made a most wholesome growth during the three years of its existence. Its membership is steadily growing and a larger portion of its activities are being guided by men who are engaged in commercial production. The seed and information service have proved especially useful to the growers.

* * *

A course of fourteen weekly lectures on eugenics will be given during the second term, of which three will be given by Professor A. W. Gilbert and one by Professor H. H. Love, both of the College of Agriculture.

* * *

A new system of marking is being tried out in several of the courses in the college. The method which is the invention of a graduate of the Agricultural college, requires that each instructor give his class marks to conform approximately to the following table of percentages: Five per cent of all marks shall be given below 60; five per cent above 90; 20 per cent between 60 and 70; 20 per cent between 80 and 90; and the remaining 50 per cent between 70 and 80. The system comes as a result of studies of the marks given to the students in the colleges of the University, but especially those in the Arts College.

* * *

The new Landscape Art building is now completely finished and is occupied by all the classes of this department. Extensive repairs have been made in the building, which was the old Poultry building.

* * *

A new greenhouse 34′ x 40′ of Moninger construction has just been completed on the north side of the greenhouse compound. This will be used for class work in vegetable gardening, while the vegetable house in the old range will be devoted chiefly to solid blocks of the important forcing crops. A headhouse 26′ x 50′ has been constructed at the same time. These buildings mark the beginning of a range which will eventually include between twelve and fifteen thousand square feet of space, and which, it is expected, will meet the most urgent requirements of the teaching work.

* * *

The Dairy department sent an extensive exhibit to the convention of the New York State Dairymen's Association which was held in Syracuse from December 9–12. There was an attendance of about 5,000 dairymen from the various parts of the State.

* * *

The general contract for the Agronomy structure has been awarded to the Durolithic Company of Buffalo at $76,987.

FORMER STUDENT NOTES

M. C. BURRITT

'08, B.S.A., '10, M.S.A.—M. C. Burritt, who until recently was editor of the *Tribune Farmer*, has now come to Ithaca as leader of the Farm Bureau work in New York State to succeed Loyd S. Tenny. The latter has gone to Florida to conduct farmers' co-operative work there.

In New York, the farm bureau work is conducted coöperatively by the College of Agriculture, the State Department of Agriculture, and the U. S. Bureau of Plant Industry. The headquarters are at Cornell and the State Leader is a Professor of the College. Mr. Burritt, who has assumed charge, was a very prominent student at Cornell. He was president of the Agricultural Association, on the Agricultural Banquet Committee, the Honor System Committee, a member of the Senior honorary society, Hebs-sa, alumni editor of the COUNTRYMAN, and a participant in many other activities. He is prominent also as a graduate being president of the Students' association.

'06, B.S.A.—Charles F. Shaw went to the University of California on the first of January, 1913, from the Pennsylvania State College where he had been Assistant Professor of Agronomy. Here he is Professor of Soil Technology, having charge of the instruction in soil physics and allied courses and also charge of the soil survey work for the state of California. In this latter work, his department is coöperating with the Bureau of Soils of the Department of Agriculture, each organization maintaining an equal number of men in the field. They are carrying on a reconnaissance soil survey of California, which will be published with maps on the scale of four miles to the inch. During the past summer they had five men in the field continuously, with two others in the field for about one-half of the time. During the winter the field party will consist of seven men. During the summer season they mapped the Sacramento Valley, an area covering something over four and one-half million acres lying in the north third of the great interior valley of this state. Some work is now being done in the San Joaquin Valley and the reconnaissance work will be carried on in the southwest section of the state, between San Diego and Los Angeles. Professor Shaw has spent the greater part of his time, since the first of July in traveling about over the state, investigating in a general way the soil conditions and agricultural possibilities, and planning for future soil survey work.

In addition to his work, he has charge of the drainage investigations that are being carried on in cooperation with the Office of Experiment Stations. At the present time they are installing a complete drainage system on an area of 160 acres near Fresno, California. This area is badly affected with alkali and has a very high water table. The land ten years ago was worth over $300 per acre, and gave excellent returns of raisin grapes and alfalfa. At the present time it will raise none of the cultivated crops.

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'08, B.S.A.—B. H. Crocheron who was editor of the COUNTRYMAN during his Senior year at Cornell, went to the University of California on the first of September, where he is associated with Professor Charles F. Shaw, as Assistant Professor of Agricultural Extension and State Leader of county agents. Professor Shaw writes: "Professor Crocheron has accompanied me on several trips and I have gone out with him several times when he was looking after his work. We are planning some extensive trips into the southern part of the state in the near future and are enjoying our opportunities to renew our acquaintance and discuss present and past Cornell matters. At the present time Professor Crocheron is very busy organizing a Ministers' Week to be held at the University Farm School at Davis. This will be most unique, as it will undoubtedly draw most of the ministers from the state. The railroads are giving free transportation and the University is supplying tents and meals. There will be four or more lectures going on continuously, something after the plan of a farmers' week. The aim of the meeting is to acquaint the ministers with the modern ideas regarding agricultural conditions, particularly with reference to rural social and economic problems. We do not propose to even try to make agriculturists out of these ministers, but we want them to know what is being done so that they can form a center for the distribution of knowledge, and particularly advise their parishoners regarding the sources from which knowledge can be obtained. I may say that Crocheron has made a decided success of all of the work that he has taken up up to the present time and is very well liked in the state."

'93, W.P.—Floyd Q. White is specializing in S. C. White Leghorns and fancy fruit on his farm at Yorktown, Westchester County, N. Y. He expects to keep about 2000 hens this winter and he is laying great stress on vigor and egg production rather than fancy points.

'99, B.S.A., '03, M.S.A.—John W. Lloyd is in charge of the Vegetable Gardening work at the University of Illinois. He has carried through a great deal of investigational work, his research bulletins on melons being especially valuable. In his work as a teacher he has attained a most enviable position at Illinois.

'05, M.S.A., '07, Ph.D.—J. Eliot Coit, who was editor of the COUNTRYMAN, '05–'06, is professor of Citriculture at the University of California. He is making a decided success of his course. Professor Coit is one of the authorities on citrus fruits on the coast and is with Dr. H. J. Webber and Dean Hunt on a committee to select the site for the new Citrus Experiment Station.

'06, M.S.A.—J. E. Howitt, who since 1906 has been connected with the Botanical Department of the Ontario Agricultural College at Guelph, Canada, is now in charge of the Department. Dr. R. E. Stone, '12, is Professor Howitt's chief assistant.

'06, B.S.A.—H. L. Westover has been connected with the Bureau of Soils, United States Department of Agriculture since his graduation. At present he is engaged in the classification of the soils of the National Forests. This work is being done by the Bureau of Soils in coöperation with the Forest Service.

'07, B.S.A.—Lynn F. Ayer, who was in charge of the Dairy Department of Hampton Institute in Virginia

(*Continued on page 184*)

for three years and later managed his home farm, is now manager of Chestnut Ridge Farm at Glens Falls, N. Y.

'07, B.S.A.—Edward W. Cleeves, who was formerly in charge of the farming operations of the John F. White Canning Co., of Mount Morris, N. Y. and who had under his supervision 1200 acres, is now managing his own farm at Rocklet, Orange County, N. Y.

'07, B.S.A.—Winfield Hale is in business in Los Angeles and sends word that he is sorry he quit the farm. He said "Get the other fellows to stick to agriculture."

'07, Sp., '03, A.B.—Mr. and Mrs. W. O. Strong spent the holidays in Ithaca. Mr. Strong is now superintendent of Kings Mill Farm, of Grove, Va. Mrs. Strong was Miss Dunn of the class of '03.

'08, B.S.A.—Royal Gilkey, who is now instructor in Extension Teaching at the College, was married on January 20th to Miss Eunice Jackson, '08, who was a teacher in the Ithaca High School.

'08, B.S.A.—Clarence Lounsbury has recently finished a soil survey of Pope County, Arkansas and expects to be doing similar work in Columbia County this winter.

'08, B.S.A.—Vaughan MacCaughey, Professor in charge of the Extension Department of the College of Hawaii, is organizing several new courses in extension work. Special attention is being given to the popularizing of the College's work in tropical agriculture, sugar technology, and field biology. Professor MacCaughey has also recently organized courses in agriculture and industrial subjects in a large secondary school in Honolulu.

'08, B.S.A.—P. O. Wood, who since his graduation has been in the service of the Bureau of Soils, U. S. Department of Agriculture, is now at work in the National Forests in Colorado classifying the soils.

'10, B.S.A.—James H. Rutherford is connected with the Payne Land Co. of Geneva, N.Y.

'11, Grad.—George M. Darrow has covered the Appalachian Fruit Belt this season in connection with the Fruit Production Investigations of the U. S. Department of Agriculture.

'11, B.S.A.—J. E. Dougherty, who graduated in poultry about two years ago, is Assistant Professor of Poultry Husbandry in the University of California and has charge of all of the poultry work. He is developing a rather extensive poultry plant on the University Farm at Davis.

'12, Ph.D.—Professor C. N. Jensen of Plant Pathology at the Utah Agricultural College has been appointed President of Brigham Young College at Salt Lake City.

'12, M.S.—G. M. Ignatiev during the past season, has been manager of a large estate on Long Island.

'12, B.S.A.—The engagement of Miss Genevieve Williams of Brooklyn, N. Y. and E. L. Markell has been announced. Miss Williams took graduate work here in 1913. Mr. Markell is now in the United States Department of Agriculture as Scientific Assistant in Pomological Investigations.

'12, B.S.A.—E. W. Peterson is at Morrisville, Pa., where he is employed by the Wm. H. Moon Co., one of the largest growers of ornamental nursery stock in the country.

'13, Ph.D.—Professor H. M. Fitzpatrick of the Department of Plant Pathology was united in marriage this September to Miss Florence Fenner of Ithaca.

'13, M.S.—T. B. Hutcheson has been made Associate Professor of the Division of Agronomy and Farm Management in the University of Minnesota. He has been placed in charge of the Plant Breeding work.

'13, B.S.—Bert C. Georgia is in charge of the Department of Vegetable Gardening under the Division of Horticulture at the Massachusetts Agricultural College.

'13, B.S.A.—Miss Dora L. Earl is teaching Biology and Physiology in the Pennsylvania State Normal School at Indiana, Pa.